

REMARKS

This amendment is responsive to the Office Action mailed April 2, 2008, in the above-referenced matter. Claims 1-5, 7-19, and 21-23, stand rejected as obvious under 35 U.S.C. § 103(a) in view of Han (KR 10-2002-0021093) in view of Contevita (U.S. Patent No. 3,396,502), and Sachs et al. (U.S. Patent Publication No. 2002/0026764) now issued as U.S. Patent No. 7,143,554). Claims 6 and 20 stand rejected as obvious in further view of Lundmark (U.S. Patent No. 5,012,627). Claims 6 and 20 also stand rejected as indefinite under 35 U.S.C. § 112, second paragraph. Applicants respectfully traverse these rejections.

Han is also published as International Publication No. WO 03/089728, and as U.S. Patent Publication No. US 2005/0115164. For convenience, when discussing Han we will refer to the published U.S. application.

I. The Present Invention

A brief summary of the presently claimed invention is herein provided, to provide context for the specific arguments for patentability presented thereafter.

As noted in the "Background of the Invention" section of the present application, the time required to complete the construction of a building is extremely important to the overall cost of the building, and therefore reducing the construction time would provide very clear benefits. In conventional concrete shear core construction, the time-consuming concrete core must stay ahead of the steel structure fabrication, which can lead to delays and scheduling difficulties.

The present invention discloses a new method of constructing concrete shear core buildings wherein a steel erection subassembly ("SES") is constructed ahead of pouring the shear core concrete. The SES comprises preassembled segments that include columns, beams and rebar. The preassembled segments are each lifted as a unit for placement during construction of

the SES. A peripheral structural steel subassembly ("PSS") is constructed about the SES, and one or more floor structures are installed that are supported by the SES and the PSS. Because the floor structure is supported by the SES and PSS, unlike conventional shear core construction methods, the steel support structure can precede the concrete shear core during construction.

Moreover, the SES structural members that support the floor structure during construction are disposed in the volume into which the concrete will be poured. Therefore, another novel feature is preassembling structural members for the SES, and a rebar curtain to form segments, and lifting each of the preassembled segments as a unit for placement during construction. This aspect is most clearly shown in FIGURE 3 of the present application, and is not found in any of the prior art of record.

II. Positive Recitation of Lifting Segments

The Office Action on page 7 states that the claims language referring to the segments being "adapted to" be lifted as a unit does not constitute a limitation in any patentable sense. The claims are therefore amended herein to clarify the intended scope of the claims, and delete the "adapted to" language, thereby more positively reciting this element. In particular:

Claim 1 is herein amended to recite, in relevant part: "erecting a steel erection subassembly for a concrete shear core, the steel erection subassembly including a plurality of preassembled segments, each preassembled segment comprising a first plurality of vertical columns, a first plurality of horizontal beams, and a rebar screen, and wherein erecting the steel erection subassembly includes lifting each of the plurality of preassembled segments as a unit for placement."

Claim 10 is herein amended to recite, in relevant part: "building a steel erection structure at least seven floors tall comprising a plurality of preassembled segments, each preassembled segment including a first plurality of vertical columns, a first plurality of horizontal beams, and a plurality of steel reinforcing bars, and wherein building the steel erection structure includes

lifting each of the plurality of preassembled segments as a unit for placement." (Claim 10 is also amended to correct an obvious error, which corrects an antecedent basis issue.)

Claim 15 is herein amended to recite, in relevant part: "building a steel erection subassembly by lifting each of the plurality of steel erection segments as a unit for placement and assembling the plurality of steel erection segments into a substantially rectangular column; "

These amendments clarify the intention of the previous amendment, and do not add any new matter. For example, at page 8, lines 12-13 of the present application, which states "the pre-assembled segments 154 are intended to be lifted as a unit for placement during construction of the steel erection structure 150."

It is respectfully requested that these amendments be entered, even if the Examiner maintains his rejection of the claims.

III. Lifting Each of the Preassembled Segments as a Unit for Placement

All of the claims, as amended herein, recite lifting preassembled segments comprising vertical columns, horizontal beams and a rebar screen as a unit for placement. None of the prior art of record discloses forming preassembled segments of vertical columns, horizontal beams and a rebar screen, and certainly none of the prior art discloses lifting such segments as a unit for placement.

Han clearly does not contemplate lifting preassembled segments comprising columns, beams and rebar screen for placement in erecting a steel erection subassembly. For example, in Fig. 3 of Han the pillars, beams and girders (23, 25, 31) are shown assembled in place, without any corresponding rebar. Han discloses repeatedly first installing the pillars, secondly installing and attaching a girder and beam, then arranging the reinforcing bars, all of these steps clearly performed *in situ* (see paragraph 0025 of US2005/0115164). Han repeats this teaching at paragraph 0031, stating the pillar is first installed, and a steel frame girder is connected, then the beam is assembled on the girder to complete the steel-frame construction. The floor beams are

attached "at this point." "After the above, a reinforcing bar 21b is mounted on a wall of the core 21..." (paragraph 0032-0033). Clearly Han teaches away from lifting a segment comprising columns beams and rebar screen as a unit for placement.

This is not a trivial or obvious difference from the present invention. As noted on page 8 of the present application, "The pre-assembled segments 154 are substantial structural components and, in the preferred embodiment, the preassembled segments 154 may weigh up to 48,000 pounds. With modern construction methods that enable great precision in the fabrication of structural components such as the pre-assembled segments 154, and due to the relatively rigid framework provided by the columns 156 and beams 158, the pre-assembly of the segments 154 may be accomplished with sufficient precision that aligning and splicing the vertically aligned columns 156 of adjacent segments 154 and overlapping the rebar screens 157 may be accomplished with relative ease."

Sachs, which is directed to forming composite reinforced concrete structural elements with a steel (or other) outer shell, clearly does not teach or disclose anything relevant to this aspect of the claimed invention. Similarly, Contevita, which is directed to a suspension system for building construction, does not teach or disclose anything relevant to this aspect of the claimed invention.

Because all of the claims recite lifting segments comprising beams, columns and a rebar screen as a unit for placement in erecting a steel structure, and this element is not disclosed or suggested in any of the prior art of record, the claims are believed to be in condition for allowance.

IV. Preassembled Segments of Steel Erection Subassembly

All of the claims in the present application recite building a steel erection structure that includes a plurality of preassembled segments comprising columns, beams, and a rebar screen, or substantially equivalent language.

Page 2 of the Office Action states that Han discloses a method for constructing a multistory concrete shear core building comprising the steps of: Erecting a steel subassembly with the subassembly including a plurality of preassembled segments including vertical columns, horizontal beams, and a rebar screen.

The applicant respectfully disagrees with this characterization of the disclosure of Han. Han teaches directly away from preassembled segments for the steel subassembly. At paragraph [0025] of Han (referring to US 2005/0115164) Han teaches:

As shown in the drawings, a high rise building is constructed by firstly installing a steel-frame pillar 23 on a shaft portion of a core 21, and is then secondly a girder 25 and a steel-frame beam 31 are installed on the steel-frame pillar 23. Then, reinforcing bars for a slab 33 and a core 21 are arranged and concretes are applied. (emphasis added)

Therefore, rather than building a steel erection structure using preassembled segments of columns, beams and rebar, Han teaches a very specific order for assembling the steel structure directly in place. No preassembly of any segments is contemplated by Han. In particular, no segments of beams, columns and rebar are contemplated.

In fact, after the pillar (23) and the beam (31) are installed, Han states only that the "reinforcing bars for a slab 33 and a core 21 are arranged." There is no teaching or suggestion that the rebar is preassembled to the other structure. The only figures in Han that show any rebar are the prior art Fig. 1, which shows conventional rebar extending from a concrete core, and Fig. 3, which shows rebar extending from the concrete very near the edges of the concrete core, and not positioned to engage the other steel structure.

None of the other art of record teaches or suggest preassembling steel erection structure comprising columns, beams and rebar.

V. Preassembled Segments Not Obvious

The Examiner also suggests on page 7 of the Office Action "that it would be obvious to preassemble multiple parts together at ground level or offsite before assembling them to the existing onsite structure."

The applicant respectfully disagrees that it would be obvious to preassemble segments comprising columns, beams and rebar. First, it is respectfully noted that none of the prior art of record discloses such a preassembly, and in fact teach directly away from such preassembled segments. Han is very clear regarding the sequence of steps in the disclosed assembly, as noted above, and the rebar does not appear to directly engage any beams or pillars.

Secondly, in conventional concrete shear core construction the shear core does not incorporate structural steel members such as beams and columns, but rather the rebar is arranged in the volume defined by the forms, without these structural elements. Contevita, for example, recites in column 3, lines 36+, "The towers 12 and 14 are preferably hollow cores of rectangular cross section formed of reinforced concrete." There is no suggestion of providing a preassembled segment with beams, columns and rebar.

Sachs et al. is directed to composite columns, and clearly the currently-claimed preassembled segments have no relevance to the invention disclosed therein. Lundmark is also directed to a very different construction (reinforced concrete buildings, which does not include a concrete shear core) and therefore the preassembled segments are not relevant to the invention disclosed therein.

VI. Claim Corrections

A few amendments are included as straightforward corrections that make the claims more consistent. For example, Claims 4 and 5 are amended to make the claims consistent with the amendment to the corresponding independent Claim 1 made in the prior amendment. Claims 13 and 18 are similarly amended for consistency with the prior amendment, and Claims 14 and 19 are canceled. Claim 10 includes an amendment as follows "~~structural~~ steel framing structure," to correct an antecedent basis problem.

CONCLUSION

The claims, as amended herein, disclose a clearly novel and advantageous method for constructing concrete shear core buildings.

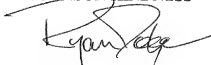
One claimed element is the lifting of segments comprising beams, columns and rebar as a unit for placement. This aspect of the invention is not disclosed or suggested by any of the art of record, and is therefore believed to be patentably distinguishable.

Another claimed element that is not disclosed in the prior art is preassembling segments comprising columns, beams and rebar. None of the prior art teaches or suggests preassembling rebar to beams and columns in an assembly. Han clearly teaches a particular sequence of construction that neither preassembles such segments, nor teaches that the rebar is directly assembled to beams or columns.

Several amendments are also made that correct minor consistency or antecedent basis errors. Entry of the amendments and a positive disposition of the application is respectfully requested.

Respectfully submitted,

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